DOCUMENT RESUME

ED 264 524 CS 008 211

AUTHOR Pittelman, Susan D.; Levin, Kathy M.
TITLE An Exploration of the Use of a Speech-Enhanced Microcomputer-Based Language Experience Program to Facilitate Beginning Reading Instruction. Program Report No. 85-6.
INSTITUTION Wisconsin Center for Education Research, Madison.
SPONS AGENCY National Inst. of Education (ED), Washington, DC.
PUB DATE Oct 85
GRANT NIE-G-84-0008
NOTE 27p.; A report from the Program on Classroom Processes: Skill Development--Language Arts.
PUB TYPE Reports - Research/Technical (143) -- Reports - Descriptive (141)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Artificial Speech; *Beginning Reading; *Computer Assisted Instruction; *Computer Software; Individualized Instruction; Kindergarten; Kindergarten Children; *Language Experience Approach; Learning Activities; Microcomputers; Primary Education; Program Development; Reading Instruction; *Reading Research

ABSTRACT

A research project was undertaken to explore the effects of using a microcomputer equipped with a speech synthesizer to enhance and aid in the individualization of the language experience approach in beginning reading instruction. A prototypic program was developed and pilot-tested with 12 kindergarten children over a three-week period, with each child participating in three individual sessions a week for two weeks. In the third week, the computer was moved into the classrooms to evaluate the benefits that a speech-enhanced system might have on the communicative environment. During the project, three areas were identified in which the microcomputer made distinct contributions to the language experience program: (1) more efficient use of teacher time and materials, (2) increased individualized and independent learning, and (3) increased student motivation. The pilot study confirmed that microcomputers with speech synthesizers can enhance the language experience approach to beginning reading. (Author/FL)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED264524

Program Report No. 85-6

AN EXPLORATION OF THE USE OF A SPEECH-ENHANCED MICROCOMPUTER-BASED LANGUAGE EXPERIENCE PROGRAM TO FACILITATE BEGINNING READING INSTRUCTION

Susan D. Pittelman
Kathy M. Levin

Project Director
Dale D. Johnson

A Report from the Program on Classroom Processes:
Skill Development--Language Arts

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
X This document has been reproduced as received from the person or organization originating it.
Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

Wisconsin Center for Education Research
School of Education
University of Wisconsin
Madison, Wisconsin

October 1985

CS008311

Acknowledgements

The authors gratefully acknowledge the students and teachers who participated in the study and the Madison Metropolitan School District for their support of this research effort.

The research reported in this paper was funded by the Wisconsin Center for Education Research which is supported in part by a grant from the National Institute of Education (Grant No. NIE-G-84-0008). The opinions expressed in this paper do not necessarily reflect the position, policy, or endorsement of the National Institute of Education.

BEST COPY AVAILABLE

Wisconsin Center for Education Research

MISSION STATEMENT

The mission of the Wisconsin Center for Education Research is to understand, and to help educators deal with, diversity among students. The Center pursues its mission by conducting and synthesizing research, developing strategies and materials, and disseminating knowledge bearing upon the education of individuals and diverse groups of students in elementary and secondary schools. Specifically, the Center investigates

- diversity as a basic fact of human nature, through studies of learning and development
- diversity as a central challenge for educational techniques, through studies of classroom processes
- diversity as a key issue in relations between individuals and institutions, through studies of school processes
- diversity as a fundamental question in American social thought, through studies of social policy related to education

The Wisconsin Center for Education Research is a noninstructional department of the University of Wisconsin-Madison School of Education. The Center is supported primarily with funds from the National Institute of Education.

Table of Contents

	Page
List of Figures	vii
Abstract	ix
I. Introduction	1
The Language Experience Approach	1
Exploratory Research On Using a Microcomputer with the Language Experience Approach	2
Description of Prototypic Program	3
II. Exploratory Studies	5
Evaluation of the Quality of a Low-Cost Speech Synthesizer	5
Evaluation of the Prototypic Computer-Adapted Language Experience Activities	5
1. Subjects	6
2. Design	6
3. Procedure	7
a. Weeks One and Two	7
1. Computer-Adapted Activities	10
2. Conventional Language Experience Activities	10
b. Week Three	12
III. Discussion and Evaluation of the Prototypic Computer-Adapted Language Experience Activities	13
Benefits of Computer-Based System	13
1. Teacher Efficiency	13
2. Individualized and Independent Learning	14
3. Motivation	15
Limitations	15
IV. Conclusions	17
References	19

List of Figures

Figure		Page
1	A computer story dictated during Week One	8
2	A computer story dictated during Week Two	9
3	A sample screen from the computer activity Sentence Scramble	11

Abstract

The focus of this research effort was to explore the effects of using a microcomputer equipped with a speech synthesizer to enhance and aid in the individualization of the language experience approach to beginning reading instruction. A prototypic program for use with children at a beginning reading level was developed and evaluated over a three-week period with kindergarten children.

The computer-adapted speech-enhanced activities, as well as a set of conventional language experience activities, were pilot-tested with 12 children, with each child participating in three individual sessions a week for two weeks. The third week of the study, the computer was moved into the kindergarten classrooms to evaluate the benefits that a speech-enhanced system might have on the communicative environment of a classroom.

During the study, three areas were identified in which the microcomputer made distinct contributions to the language experience program. These areas were: 1) more efficient use of teacher time and materials, 2) increase in individualized and independent learning, and 3) increased student motivation. The exploratory study confirmed the expectation that a microcomputer with speech capabilities can enhance the language experience approach to beginning reading. The software used in this study consisted of five prototypic components, but it was sufficient to demonstrate the potential of this media. With the refinement and expansion of the prototype into a more complete user-friendly program, the microcomputer-based language experience system could make a valuable contribution to beginning reading instruction.

I. Introduction

The language experience approach to teaching beginning reading brings the language arts skills of speaking, listening, writing, and reading together as a unit. The use of a microcomputer with a speech synthesizer could greatly enhance this already successful approach to beginning reading. Combining the modality of speech with reading and writing should help beginning readers to more readily discover the interrelationship between these modes of communication.

THE LANGUAGE EXPERIENCE APPROACH

Mary Anne Hall (1979) defined the essence of the language experience approach as

> the use of the language and thinking of the learner as a foundation for reading instruction. Each learner's language and personal experience are used to create reading material which help to show the reader the relationship between the written language and his already familiar oral language. (p. 1)

The language experience approach serves not only as a bridge between oral and written language for a beginner reader, but also capitalizes on the interrelationship between writing and reading. It has been found that, when a writing component is added to reading instruction, reading achievement is enhanced (Bond & Dykstra, 1967; Dykstra, 1968). Studies of children who learn to read at home in their preschool years have shown that these children often learned to write before learning to read (Durkin, 1974-75; Hall, Moretz, & Statom, 1976). In a language-centered reading approach, writing and reading serve as complementary elements in learning the written language.

Boiarsky and Johnson (1983), strong advocates of the language experience approach, recommend that reading and writing be taught together, as part of children's general cognitive development. To support their viewpoints, they cite Goodman's and Clay's research which reveals the interrelationship between reading and writing, with the two skills seeming to be connected through oral/aural language to a common base of cognition. Boiarsky and Johnson concluded that

> if the processes and skills for reading and writing are inextricably intertwined, and if the development of these skills parallels and depends on oral/aural language skills, then the most effective method for teaching both reading and writing would be one which is based on oral/aural language and in which reading and writing are combined. The Language Experience Approach provides such a method. (p. 39)

Several research studies have been conducted to compare the language experience approach with more traditional reading instruction. In many of these studies, the language experience approach was found to be at least as effective as other approaches (Bond & Dykstra, 1967; Kendrick & Bennett, 1967; Stauffer & Hammond, 1965). In other studies, the language experience approach proved to be more effective than more traditional approaches to reading instruction (Cohen, 1976; Kelly, 1975; Kendrick & Bennett, 1967; Messerschmidt, 1977; Stauffer & Hammond, 1965; Vilscek & Cleland, 1966). Measures on which subjects in a language centered approach significantly outscored subjects in more traditional approaches include measures of vocabulary and word recognition skills (Kelly, 1975; Messerschmidt, 1977; Stauffer & Hammond, 1965), comprehension measures (Messerschmidt, 1977), syntactically more mature sentences (Cohen, 1976), reading achievement test scores (Cohen, 1976; Stauffer & Hammond, 1965; Stauffer & Hammond, 1967), measures of creativity (e.g. writing) (Hall, 1978; Stauffer & Hammond, 1965; Stauffer & Hammond, 1967), and spelling (Hall, 1978).

Bond and Dykstra (1967) compiled data from 27 individual studies that compared several different beginning reading approaches with the basal approach. They concluded that "no one approach is so distinctly better in all situations and respects than the others that it should be considered the one best method to be used exclusively" (p. 123). They found that combinations of programs are often superior to single approaches. Bond and Dykstra stated that "the success of such methods as the Language Experience approach indicates that the addition of language experiences to any kind of reading program can be expected to make a contribution" (p. 122).

EXPLORATORY RESEARCH ON USING A MICROCOMPUTER WITH THE LANGUAGE EXPERIENCE APPROACH

With the advent of the computer age, several improvements to the conventional language experience approach became available. Bradley (1982) and Casey (1984) have conducted exploratory studies to examine the effects of using a microcomputer in a language experience program.

Bradley (1982) conducted a study with three groups of five to six first graders in which she typed group language experience stories into a computer. She concluded that there were several advantages in using the computer to record language experience stories:

1. Children were highly motivated by seeing their spoken language appear on the screen. They were eager to contribute their ideas and read the sentences as they were displayed.

2. The speed at which the stories could be transcribed seemed to increase the children's enjoyment of the lesson.

3. The children realized how readily changes could be made to the story. They made several changes and corrections as they were creating their stories.

4. The length of each of the three group stories was between 76 and 127 words as compared with the average story length of between 25 and 40 words for language experience stories (as reported by Hall, 1981).

5. The capability of producing printed copies of language experience stories for immediate distribution is a decided advantage over the traditional language experience lessons in which children must wait (typically until the next day) to get a copy of their story.

Casey (1984) compared two contexts for teaching a group language experience reading lesson: a traditional language experience lesson based on Van Allen's (1976) work and a similar language experience lesson that used both a microcomputer to type in the stories and a speech synthesizer to speak the stories. Her subjects were five 5-year-old students representative of different ethnic groups. Casey found that the use of a microcomputer with speech synthesis did indeed enhance the language experience approach. Casey also concluded that "the visual, auditory and kinesthetic nature of the microcomputer lesson seems to meet the needs of all type of learners regardless of modality, and offers hope of success to youngsters who have not yet developed motor coordination for the task of writing" (p. 13).

DESCRIPTION OF PROTOTYPIC PROGRAM

In light of the positive findings by Bradley and Casey, it was felt that potential contributions of the microcomputer within a language experience program merited further exploration.

A key aspect of a language experience program is the related activities done following the dictation of the story. Use of a microcomputer is expected to enhance not only the recording and reading components of a language experience program, as demonstrated by Casey and Bradley, but the follow-up activities as well. The follow-up activities in a conventional language experience approach typically include practice in reading the story and doing activities which use words and sentences from the story. To develop appropriate extension activities from a student's language experience stories, a teacher needs to have student records which include lists of stories, words, and activities completed. Not only can the computer perform

this record-keeping function, but it can also be used to generate a series of "generic" follow-up activities which use the words and sentences from a student's own stories.

In early 1985, a prototypic version of a speech-enhanced microcomputer-based language experience program was developed. This program included the following three components:

1. A simplified word processor to allow easy recording and printing of students' stories.

2. A filing system to keep individual student records.

3. Several "generic" follow-up activities to provide students with practice in reading words and sentences from their own stories as well as with opportunities to hear the computer speak their stories.

II. Exploratory Studies

EVALUATION OF THE QUALITY OF A LOW-COST SPEECH SYNTHESIZER

Concurrent with the conceptualization of the prototypic program, an evaluation of several speech synthesizers was conducted. The primary purpose of this evaluation was to identify a speech synthesizer that would have acceptable text-to-speech quality and yet would be reasonably priced.

An informal two-part evaluation of the speech quality produced by a low-cost speech synthesizer was conducted in March 1985 with 20 kindergarten children to determine if the quality of speech from this system would be adequate. In the first part of the evaluation procedure, the child was asked to repeat whole sentences and to respond to a series of questions spoken by the computer. In the second part of the evaluation, the child dictated a story which was typed into the computer. The child was then asked to repeat each sentence from the story after hearing it spoken by the computer.

The results indicated that, with the exception of the students who were not fluent in the English language, children were generally able to understand the synthesized speech. Comprehension of the synthesized speech in the first part of the evaluation procedure was nearly 80%. Of primary interest, however, was the level of the children's performance in the second part of the procedure, as that task was representative of the one that would be required in the proposed language experience program. Over 75% of the children were able to repeat all of the sentences from their stories without errors. The remaining 25% of the students were able to repeat most sentences in their stories accurately and retained the overall meaning of the remaining sentences. Having confirmed the intelligibility of the speech synthesizer with kindergarten children, projects efforts were then directed toward developing the prototypic computer activities.

EVALUATION OF THE PROTOTYPIC COMPUTER-ADAPTED LANGUAGE EXPERIENCE ACTIVITIES

In Spring 1984, a pilot investigation was conducted to evaluate the prototypic computer-adapted language experience program. There were three major objectives of the pilot study. The first was to evaluate the newly developed computer-adapted language experience activities. The second purpose was to determine whether there are, indeed, any advantages (or disadvantages) to using a microcomputer with speech capabilities as an integral part of a language experience

program. The third goal was to gain insight into how a speech-enhanced language experience program would fit into an overall kindergarten program and the potential benefits that this mode of communication would have on a classroom language arts curriculum. To meet this third goal, the computer was to be moved into the kindergarten classroom for the third week of the study.

It was anticipated that several specific advantages of using a speech-enhanced microcomputer with a language experience program would be demonstrated through the pilot investigation. Using a microcomputer, dictation should be taken more quickly, and students should be able to more easily revise their stories. Stories would not have to be recopied to ensure that they were legible. Furthermore, once a story had been recorded, it could be easily stored for later use. It was also anticipated that students participating in the microcomputer-enhanced version would not need as much assistance from the instructor as children participating in the conventional language experience activities. There was also an expectation that the level of interest or amount of motivation would be higher with the computer-enhanced version.

Subjects

Twelve children from two kindergarten classrooms were identified to participate in the language experience activities. Children were selected to participate in the study based on a screening procedure which included four criteria: teacher judgment regarding children's level of readiness for reading instruction, the grade level score from the Word Identification subtest of the Woodcock Johnson Battery, the score from an informal sight word test created by the research staff, and the children's ability to read the preprimer and primer paragraphs from the Silvaroli Classroom Reading Inventory. Children were recommended by their teachers for screening. Those children who then demonstrated that they had some sight word vocabulary but could not fluently read the two paragraphs were chosen to participate in the pilot study. The twelve children, four boys and eight girls, represented a range of prereading abilities.

Design

The study was designed so that half of the subjects participated in the computer-adapted activities and the other half participated in the conventional language experience activities (using paper and pencil). Each child was assigned to work with one of two trained experimenters in a room apart from the classroom. Each experimenter worked individually with an equal number of children in both conditions. While one experimenter worked with a child participating

worked individually with an equal number of children in both conditions. While one experimenter worked with a child participating in the conventional language experience approach, the other experimenter worked with a child using the computer. The computer system used consisted of an Apple II Plus computer with 64K, the S.A.M. Speech Synthesizer by Tronix, a NEC monochrome monitor, and an Epson printer.

Procedure

Each child in the study participated in three individual instructional sessions per week for two weeks. Each of these sessions lasted approximately 20-25 minutes. During the third week of the study, the computer was moved into the kindergarten classrooms and made available to all the children in the class.

WEEKS ONE AND TWO

According to Hall (1976), the five major components of a language experience lesson are motivation, discussion, recording, reading, and follow-up activities. The first two parts of the lesson, motivation and oral discussion, are traditionally done prior to recording a student's story. Even for the children using the microcomputer it was felt that these first two components of a language experience lesson, motivation and discussion, would still be most effectively accomplished "off the computer."

During the first lesson of each week, children in both conditions dictated a language experience story. In the first week of the study, children dictated a story about themselves. (A story dictated by a child in the computer condition is presented in Figure 1.) In the second week, children were shown how to fold construction paper to make a puppet and then the puppet served as a stimulus for the story. (A story dictated by a child in the computer condition during the second week is presented in Figure 2.)

Following dictation of the story, the children in both conditions participated in a variety of follow-up activities. These activities included drawing a picture to illustrate the story, practicing reading the story, reviewing words from the story, and recreating sentences from the story.

Following is a description of how these activities were adapted for the computer-enhanced language experience approach and how they were implemented in the conventional language approach.

CECIL WROTE THIS STORY
BY
(Student's Name)

I LIKE TO PLAY WITH MY FRIENDS. WE LIKE TO PLAY HE MAN. WE LIKE TO PLAY FREEZE TAG. I AM SIX YEARS OLD. I PLAY WITH MY COUSINS WHEN I GO OVER TO THEIR HOUSE. I PLAY WITH MY MA WITH HER GAMES.

Figure 1. A computer story dictated during Week One.

MY PUPPET
B
(Student's Name)

I MADE A PUPPET TODAY. HER NAME IS NIKI. SHE LIKES TO TALK. SHE IS WEARING LIPSTICK AND A HAT. SHE HAS A BIG TONGUE. I LIKED MAKING HER. I WOULD LIKE TO MAKE ANOTHER PUPPET.

Figure 2. A computer story dictated during Week Two.

Computer-Adapted Activities

1) Record a Story. This component of the computer version consisted of a simplified word processor in which the experimenter typed the story into the computer as a child dictated it. The story was then saved in the child's file.

2) Hear a Story. The computer "read" back the story. The child had the option of hearing the computer speak the whole story or a single word at a time. (In either option, as a word was being spoken it was highlighted on the screen.)

3) Print a Story. A copy of the story was printed out. The story was printed on the paper exactly as the story appeared on the screen, except that the story was printed on the bottom portion of the paper to allow space for the child to draw a picture in the top half of the paper. (See Figures 1 and 2.)

4) Word Bank. The computer randomly selected fifteen words from the child's story. One word at a time appeared on the screen and the computer told the child to try to "read the word." The computer then pronounced the word aloud and the child pressed the "YES" or "NO" key to indicate whether or not she/he had read the word correctly. Depending on which key the child pressed, the word then appeared under the YES or NO column on the screen. The activity continued until all the words appeared under the YES column.

5) Sentence Scramble. The shortest sentence from the child's story appeared on the screen and the computer told the child to "try to read the sentence." The computer then spoke the sentence aloud. The words from the sentence then appeared in two columns at the bottom of the screen and the child had to recreate the sentence by placing the words at the bottom of the screen in the correct order. (See Figure 3.) The child then had the option of either making the same sentence again or repeating the procedure with another (the next shortest) sentence.

Conventional Language Experience Activities

Story Dictation, Recording and Reading. Dictation of the language experience stories in the off-computer version was taken by the experimenter on story-chart paper (18 x 16 1/2 inch lined paper with blank space at the top for a picture). After the story had been dictated, the experimenter read the story back to the child and then listened (and gave feedback) as the child read the story aloud.

Word Bank. Prior to the lesson, the experimenter randomly selected fifteen words from the child's story and made a flashcard for each word as well as a flashcard for the words yes and no.

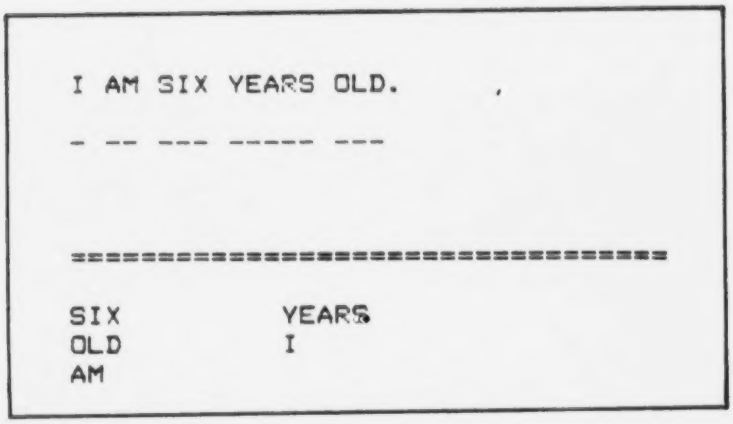

Figure 3. A sample screen from the computer activity Sentence Scramble.

During the lesson, the experimenter showed the child one flashcard at a time and asked the child to read it. If the child correctly read the word on the flashcard, the experimenter put the flashcard in the "yes" pile. If the child read the word incorrectly, the flashcard was placed in the "no" pile. Any words that were in the "no" pile were shown again to the child with the activity continuing until all the words were moved to the "yes" pile.

Sentence Scramble. Prior to the lesson, the experimenter chose three sentences from the child's story and wrote each sentence on a strip of tagboard and made a flashcard for each word in the sentence. During the lesson, the experimenter showed the child the tagboard strip and asked the child to read the sentence aloud. The child was then given the appropriate flashcards and told to recreate the sentence by placing the flashcards in the correct order. The child was asked to read the completed sentence and then given the opportunity to create a new sentence using the same flashcards.

WEEK THREE

During the third week of the study, the computer was set up in the kindergarten classrooms. Children who participated in the computer version were given the opportunity to let other children in the classroom hear their stories. Children who participated in the conventional language experience approach either had one of their previously dictated stories entered into the computer or dictated a new story which was entered into the computer. Other children in the classroom had the opportunity to work in pairs dictating stories (Record a Story) and hearing the stories spoken back (Hear a Story). A copy of the story was printed out (Print a Story) and children drew a picture at the top of the page. Children also were given the opportunity to do the computer-adapted versions of Word Bank and Sentence Scramble.

During this week, a large-group experience story from one of the classes was entered into the computer. Children from this classroom were able to hear their large-group story spoken by the computer and do some of the follow-up activities.

III. Discussion and Evaluation of the Prototypic Computer-Adapted Language Experience Activities

As anticipated, both the conventional and the microcomputer-based approaches to language experience were very successful. Children in both conditions seemed to enjoy the language experience activities and to benefit from them.

Children who had demonstrated a sight word vocabulary of at least 10 words on the screening test easily learned to read their stories and were successful at reading isolated words from their stories. Participating in the language experience activities appeared to help these children as they were making the transition from the prereading stage to the beginning reading stage. They seemed to greatly benefit from the opportunity to read whole stories that were meaningful to them. Children in the study who had recognized only a few sight words on the screening test still experienced some success in reading their stories and did learn to identify a few isolated words from their stories. For these children, primary benefits of participating in the language experience activities were developing confidence in their ability to learn to read and motivating them to want to further develop this ability.

The three-week pilot study produced some valuable insights into the benefits of using a microcomputer with speech capabilities to enhance the language experience program for beginning readers. Three areas in which it appeared that the microcomputer made distinct contributions to the language experience program were (1) More Efficient Use of Teacher Time and Materials, (2) Increase in Individualized and Independent Learning, and (3) Increased Student Motivation.

BENEFITS OF COMPUTER-BASED SYSTEM

Teacher Efficiency

The recording of the child's story and the printing of a copy of the story was greatly facilitated by the use of Record a Story and Print a Story. While children in both conditions were supplied with a copy of their story following dictation, the children in the computer condition received a "printed" copy that seemed to impress them. The copies of the stories that had been dictated in the conventional approach were often cumbersome to handle, as the paper was large and several pieces of paper had to be taped together for the longer stories. Furthermore, when children wanted to change the wording when dictating a sentence, the computer had the potential to

accommodate the change, whereas in the conventional version, the original words had to be scratched out. In several instances, the experimenters had to recopy the stories for legibility. An additional benefit of using the computer to record and print stories was that multiple copies of the story could be printed out.

The stories dictated by children working with the computer were automatically stored as part of the Record a Story program. This feature facilitated the easy incorporation of the words and sentences from a child's story into the follow-up activities. In the conventional approach, the experimenter had to make flashcards and recopy sentences for each story. This procedure was automatically done by the computer, thereby saving significant amounts of teacher time and materials.

Individualized and Independent Learning

Most teachers find that they are able to use the conventional language experience approach only with a large group of students, because taking dictation, preparing the follow-up materials, and providing each child with the necessary instructional feedback are all very time-consuming tasks. A significant advantage of a computer-based language experience system is that it facilitates the individualization of the language experience approach by providing a teacher with a set of "generic" follow-up activities that automatically incorporate each child's words. This feature enabled the experimenters to select the most appropriate follow-up activities for each student without having to spend the time to prepare individualized materials.

The addition of speech to a computer-based language experience program greatly facilitated children's working independently. After the initial demonstration of a follow-up activity by the experimenter, a student was able to work independently. The need for interaction with the experimenter was minimal as the computer activities had been designed to provide the appropriate spoken feedback to the student. A child who did not know how to read a word could press a key to hear the computer speak the word aloud. Directions were also spoken by the computer during selected parts of certain activities. In the conventional version, the experimenter needed to continually interact with the child to explain directions and provide feedback. While the experimenter was always present when the child was working on the computer, the experimenter's interaction with the child seemed negligible in comparison to the amount of interaction required in the conventional condition.

Motivation

While the children assigned to the computer condition appeared highly motivated and most eager to work on the computer, some of their motivation can be attributed to the novelty of participating in a study, as children in the conventional approach were also excited to have the opportunity to work with an experimenter. However, children assigned to the computer condition repeatedly asked if they could stay in from recess to write more stories on the computer. What particularly seemed to fascinate the children was hearing the computer speak their stories as part of the activity Hear a Story. Children were also very excited when they saw words or sentences from the stories they had written appear on the screen during the follow-up activities. Watching their stories being printed and receiving a "printed" copy of their own story was also very reinforcing for the children.

LIMITATIONS

The results of the three week study were most encouraging. There are, however, several areas that need to be improved in order for a speech-enhanced microcomputer-based language experience program to meet its full potential.

The major limitation of the prototypic version of the language experience program was that it did not include the capability for the experimenter to make adjustments for phonetically irregular words so that they would be spoken correctly. The words that were most frequently mispronounced by the speech synthesizer included the children's names and other proper nouns. While the majority of the children appeared amused by the mispronounciations, a few children seemed to be somewhat distracted. The capability to adjust for phonetic irregularities should be investigated further for incorporation into the program.

In general, the activities in the prototypic program met the planned objectives. While these activities were adequate for research purposes, they do need to be further refined before the program can be fully implemented in a classroom. Refinements would include more complete directions for activities as well as revisions in the main menu and record-keeping files to make the program more "user friendly." During the three-week exploratory study, several modifications that needed to be made for specific activities also became apparent. These included (1) improving the editing capabilities of the Record a Story component, to facilitate changes and corrections as students dictate their stories; (2) adding more user control for accessing speech in selected activities; (3) increasing the use of the highlighting of words as they are spoken by

the computer; and (4) improving the quality of the screen displays, e.g., having the story appear on the screen double-spaced.

IV. Conclusions

The exploratory study confirmed our belief that a microcomputer with speech capabilities has the potential to enhance the language experience approach to beginning reading. Although researchers and practitioners alike recognize the desirability of using the language experience approach to teach beginning reading, a major limitation to its more widespread use has been the difficulty teachers have in finding the time to do language experience activities with individual students. As a result, the implementation of the language experience approach in classrooms has been limited primarily to large group settings. The findings of the exploratory study suggest that using a microcomputer with speech capabilities can greatly facilitate the use of language experience approach with individual students. Using a microcomputer, stories can be easily recorded and copies of the stories can readily be made available. It is the computer's ability to keep individual student records and generate individualized follow-up activities, however, that would have the greatest impact on individualizing the language experience approach. Furthermore, the addition of speech to the follow-up activities would enable students to work independently on story-related activities.

While a computer-based language experience program would help teachers individualize the language experience approach and afford students the opportunity to work independently on their stories, it must be recognized that the teacher's role would still be critical to the successful implementation of the program. The teacher would still need to be actively involved in the language experience process by taking dictation, monitoring children's progress, and assigning the appropriate follow-up activities.

Not only did the exploratory study demonstrate that the microcomputer had the potential to aid in the individualization of the language experience approach, but there were also indications that a speech-enhanced computerized system could enrich the "communicative context" of the classroom. Liebling (1984) stated that "perhaps one of the greatest challenges a teacher faces is to create a classroom communicative context within which students are motivated to share meaningful experiences." Liebling believes that in the home environment children are encouraged to share their thoughts and feelings through spoken language and that teachers should extend this sharing of meaning by "creating classroom environments in which written language experiences and microcomputer-based writing and reading activities are surrounded by familiar spoken language."

During the third week of the study, when the computer was moved into the classroom, children were eager to "hear" the stories that their classmates had written and wanted to have a chance to practice reading their classmates' stories. With the addition of speech

synthesis to the language experience stories, the microcomputer provided a vehicle for children in the classroom to share their stories with each other in a way that would not otherwise be possible for beginning readers. This computerized language experience system with speech synthesis has the potential for becoming a key element in helping primary teachers improve the communicative context of their classrooms.

While the software that was used in this study consisted of five prototypic components, it was sufficient to demonstrate the potential of this media. The next step would be the refinement and expansion of the prototype into a more complete user-friendly program that would offer a wider selection of follow-up activities. Once these refinements are completed, the microcomputer-based language experience system could have a great impact on the instruction of beginning reading in primary classrooms.

References

Boiarsky, C., & Johnson, C. (1983). The excellence in education report: Connecting reading, writing, and thinking. Curriculum Review, 22(5), 37-40.

Bond, G., & Dykstra, R. (1967, Summer). The cooperative research program in first-grade reading instruction. Reading Research Quarterly, 2, 5-142.

Bradley, V. N. (1982, October). Improving students' writing with microcomputers. Language Arts, 59, 732-743.

Casey, J. M. (1984, October). Beginning reading instruction: Using the LEA approach with and without microcomputer intervention. Paper presented at the Computers, Reading, and Language Arts Conference, Chicago, IL.

Cohen, E. L. (1976). A case study of the implementation of an integrated language experience approach in an elementary school. Ann Arbor, MI. ED 140 308

Durkin, D. (1974-75). A six-year study of children who learned to read in school at age four. Reading Research Quarterly, 10, 9-61.

Dykstra, R. (1968, Fall). Summary of the second-grade phase of the cooperative research program in primary reading instruction. Reading Research Quarterly, 4, 49-70.

Hall, M. A. (1976). Teaching reading as a language experience (2nd ed.). Columbus, OH: Merrill.

Hall, M. A. (1978). The language experience approach for teaching reading. Newark, DE: IRA.

Hall, M. A. (1979, September). Language-centered reading: Premises and recommendations. Language Arts, 56, 664-670.

Hall, M. A. (1981). Teaching reading as a language exprerience. Columbus, OH: Merrill.

Hall, M. A., Moretz, S., & Statom, G. (1976). Writing before grade one--A study of early writers. Language Arts, 53, 582-585.

Kelly, A. M. (1975, March). Sight vocabularies and experience stories. Elementary English, 52, 327-328.

Kendrick, W., & Bennett, C. (1967, May). A comparative study of two first grade language arts programs--Extended into second grade. The Reading Teacher, 20, 747-755.

Liebling, C. R. (1984). Creating the classroom's communicative context: How parents, teachers, and microcomputers can help. (Reading Education Report No. 47). Center for the Study of Reading. University of Illinois at Urbana-Champaign.

Messerschmidt, R. (1977). Devising and implementing a program to improve reading skills among selected students. (ED 142 954)

Stauffer, R., & Hammond, W. (1965). Effectiveness of language-arts and basic-reader approaches to first-grade reading instruction-extended into second grade. (Cooperative Research Project No. 3276). Washington, DC: United States Department of Health, Education, and Welfare.

Stauffer, R., & Hammond, W. (1967, May). The effectiveness of language arts and basic reader approaches to first grade reading instruction. The Reading Teacher, 20, 740-746.

Van Allen, R. (1976). Language experience in communication. Boston: Houghton Mifflin.

Vilscek, E., & Cleland, D. (1966). Comparison of the basal and the co-ordinated language experience approaches in first grade reading instruction (Co-operative Research Project No. 2729). Washington, DC: United States Department of Health, Education, and Welfare.